STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

Intermat **York County** **Biddeford, Maine** **A-302-71-M-M**	**Departmental** **Findings of Fact and Order** **Air Emission License** **Amendment #1**

After review of the air emissions license minor revision submittal, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., Section §344 and Section §590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

Intermat of Biddeford, Maine has submitted a minor revision to add a new process line to the air emission license. The process will produce quartz parts using three dimensional woven quartz fiber impregnated with colloidal silica.

Intermat is currently licensed under A-302-71-L-R for the operation of emission sources associated with the production of carbon and graphite materials used primarily for defense and aerospace applications.

B. Emission Equipment

There will be no new emission equipment added at the facility. The quartz process will utilize existing equipment.

C. Application Classification

The application for Intermat does not include the licensing of increased emissions or the installation of new or modified equipment. The application is considered to be a minor revision to allow for the quartz process. This minor revision to the air emission license has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 CMR 115 (last amended December 24, 2005).

II. MINOR REVISION DESCRIPTION

Intermat produces carbon and graphite materials through the preparation of carbon yarns and fibers, weaving the carbon fibers to form a two or three dimensional matrix, impregnating the fiber matrix with petroleum or coal tar pitch, carbonizing the pitch, and continuing the process with densification, re-impregnation, and graphitization.

Quartz Process

Intermat has proposed to produce a limited amount of quartz parts (estimated at up to 2 a month) using some of the currently licensed equipment. The quartz process includes weaving high purity quartz fibers to form a two or three dimensional matrix known as a preform. The preform is then heat cleaned to remove sizing. After heating, the quartz preform undergoes vacuum and/or pressure impregnation with aqueous 40% colloidal silica (SiO_2). Following the impregnation, the part is then oven dried and sintered at a high temperature to form a cohesive structure. The impregnation, drying, and sintering may then be repeated until the final density is reached.

Quartz Process Emissions

The heat cleaning of the preform matrix at the beginning of the process will be vented to the atmosphere. Additional control was not proposed due to the intermittent operations, limited quantity of parts being manufactured, and minimal emissions (based on the MSDS sheet for a typical quartz fiber yarn).

Impregnation of the quartz matrix with the colloidal silica can be conducted using either a vacuum-only impregnation process, or a vacuum/pressure impregnation process. In the vacuum-only process, the quartz preform or partially densified quartz part is placed in a smaller, dedicated silica impregnation vessel, which is then closed, and a vacuum is drawn on the vessel and SiO_2 impregnant is drawn into the vessel to infiltrate the part. If a pressure impregnation is desired to be subsequently applied, the vacuum is released from the vessel and the impregnation vessel containing the preform and impregnant will be put in one of the existing PIC (Pressure/Impregnation/Carbonization) vessels. After loading the impregnator into the PIC vessel it will be closed and pressurized with gas. Potential particulate matter from the vacuum pump exhaust will be controlled with a coalescent filter. The pressure relief from the PIC vessel will be vented to the existing PIC scrubber. An MSDS sheet was submitted for a typical colloidal silica (SiO_2) dispersion which listed a low health rating of one (1); fire and reactivity ratings of zero (0); and amorphous silicon dioxide and water as the components with no carcinogens or hazardous substances.

Once impregnated, dried (at approximately 250°F) and sintered (at approximately 1562°F), the process may be repeated. All of these processes use electric ovens with no fuel burning emissions.

BACT for the quartz process has been determined to be the use of existing equipment and controls, including a coalescent filter on the vacuum pump exhaust and the PIC scrubber on the pressure relief from the PIC vessel.

Quartz Process Supporting Activities

The finished parts will be machined and eventually the surfaces may be sprayed with an aluminum/plasma coating. The machining equipment vents to the existing licensed dust collection system. The dust collection system represents BACT for the control of particulate matter from the machining of the quartz parts.

The dust collection system requirement in condition (25) of air emission license A-302-71-L-R is the following:

> 'Intermat shall use a cartridge dust collector to control particulate matter from the machine shop. Intermat shall be limited to no greater than 10% opacity on a 6 minute block average basis, except for no more than one (1) six (6) minute block average in a 1 hour period from the dust collector when it is vented outside through the roof vents. The facility shall take corrective action if visible emissions from the dust collector exceed 5% opacity when vented outside. [MEDEP Chapter 101]'

The aluminum plasma spray unit has been proposed as meeting the criteria for 06-096 CMR 115, Appendix B, Section (A)(66): "Plasma etcher or plasma spray unit, using dust collection to prevent fugitive emissions and using only oxygen, nitrogen, carbon dioxide, or inert gas that do not emit VOCs or HAPs". The aluminum itself is not a HAP and no HAP gases are expected to be used. Intermat will maintain documentation of the plasma spray operations to ensure it continues to meet the insignificant activity exemption.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-302-71-M-M subject to the conditions found in air emission license A-302-71-L-R and the following conditions:

Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

SPECIFIC CONDITIONS

The following shall replace condition (20) in air emission license A-302-71-L-R:

(20) Hot Isostatic Press (HIP) Vessels

A. Intermat shall control emissions from the Hot Isostatic Press Vessels with the HIP scrubber during the standard carbon-carbon HIP cycle or the quartz process. The scrubber shall be operated in accordance with the design parameters and a scrubber minimum flow of 3 gal/min shall be maintained.

B. Intermat shall maintain a log documenting all repair and maintenance on the scrubber.

C. Intermat shall control emissions from the production of molded phenolic products in the HIP vessels with the condenser and coalescent filters.

D. Intermat shall control emissions from the quartz vacuum process in the HIP vessels with the coalescent filters.

[06-096 CMR 115]

NEW CONDITIONS

(28) Intermat may manufacture quartz parts using a process involving three-dimensional weaving and impregnation with colloidal silica. Records shall be maintained of the amount of quartz parts produced. [06-096 CMR 115, BACT]

(29) The machining of the quartz parts shall be controlled through the dust collection system operated as licensed in A-302-71-L-R, condition (25). [06-096 CMR 115, BACT]

(30) Intermat shall maintain documentation of the plasma spray operations to ensure it continues to meet the insignificant activity exemption of 06-096 CMR 115, Appendix B, Section (A)(66): "Plasma etcher or plasma spray unit, using dust collection to prevent fugitive emissions and using only oxygen, nitrogen, carbon dioxide, or inert gas that do not emit VOCs or HAPs". [06-096 CMR 115]

DONE AND DATED IN AUGUSTA, MAINE THIS 13th DAY OF January, 2009.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: James P. Brooks for
DAVID P. LITTELL, COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-302-71-L-R.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: August 11, 2008
Date of application acceptance: August 19, 2008

Date filed with the Board of Environmental Protection: _____

This Order prepared by Kathleen E. Tarbuck, Bureau of Air Quality.